



## Use of “Zingiber Officinale Roscoe L” Root in Various Diseases

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**Abstract:** Numerous studies have shown that regular consumption of certain fruits and vegetables can reduce the risk of many diseases [1,29]. Natural nutritional agents have received considerable attention due to their role in promoting health and reducing the risk of many diseases, including cancer [2,30]. The rhizomes of Zingiber officinale Roscoe (Zingiberaceae), the oldest commonly known plant as ginger, are an important kitchen spice and also have many health benefits [3,31]. Ginger rhizome is commonly added to food as a spice or taken as a dietary supplement and has been widely used throughout history in various traditional systems of medicine to treat arthritis, rheumatism, sprains, muscle aches, sore throats, spasms, hypertension, dementia, fever, infectious diseases, cataracts, nervous diseases, gingivitis, toothache, asthma, stroke and diabetes [4,32]. Ginger may act as a supplement and protect against cancer [5,33]. In addition, in chemotherapy, ginger may reduce some of the symptoms of treatment (such as nausea) [6,34].

**Key words:** Zingiber officinale Roscoe (Zingiberaceae), 6-Gingerol, Cancer protection.

**Introduction.** Numerous studies have shown that regular consumption of certain fruits and vegetables can reduce the risk of many diseases [7,35]. Natural nutritional agents have received considerable attention due to their role in promoting health and reducing the risk of many diseases, including cancer [8,36].

**Materials and methods of research.** The rhizomes of Zingiber officinale Roscoe (Zingiberaceae), the oldest commonly known plant as ginger, are an important kitchen spice and also have many health benefits [9,37].

**Research results.** Ginger rhizome is commonly added to food as a spice or taken as a dietary supplement and has been widely used throughout history in various traditional systems of medicine to

treat arthritis, rheumatism, sprains, muscle aches, sore throats, spasms, hypertension, dementia, fever, infectious diseases, cataracts, nervous diseases, gingivitis, toothache, asthma, stroke and diabetes [10,38]. Ginger is also used as a home remedy and is of great value in the treatment of various stomach ailments such as constipation, indigestion, belching, bloating, gastritis, epigastric discomfort, stomach ulcers, indigestion, nausea and vomiting, and scientific studies have confirmed ethno-medical uses [11,39]. Various preclinical and clinical studies have also shown that ginger has antiemetic effects against various emetic stimuli. Ginger is composed of several bioactive compounds that contribute to its known biological activity [12,40]. Ginger has been found to contain a variety of biologically active compounds, including phenolic compounds, terpenes, lipids, and carbohydrates [13,41]. Therefore, its pharmacological effects are largely associated with phenolic ingenerol is the most pharmacologically active among these compounds [14,42]. Data collected from the experimental (in vitro or in vivo) and clinical studies discussed in this review indicate that ginger extract and [6]-gingerol exert their effects through important mediators and cell signaling pathways, including Bax/Bcl2, p38/MAPK, Nrf2, p65/NF- $\kappa$ B, TNF- $\alpha$ , ERK1/2, SAPK/JNK, ROS/NF- $\kappa$ B/COX-2, caspase-3, -9 and p53. This suggests that ginger derivatives in the form of an extract or isolated compounds exhibit appropriate antiproliferative, antitumor, invasive, and anti-inflammatory activity [15,43]. There is growing evidence linking diet to cancer prevention and treatment. Cancer is the second leading cause of death in the world after cardiovascular disease, with important socioeconomic consequences [16,44]. Some dietary components, such as ginger and its compound 6-gingerol, may be associated with a reduced risk of cancer [17,45]. Antiproliferative activity was assessed using tritiated thymidine ([<sup>3</sup>H]Tdr) incorporation studies into YYT colon cancer cells; the anti-angiogenic ability of gingerol was assessed by Matrigel assays using MS1 endothelial cells. These selected biologically active substances of ginger had: 1) a direct effect on the proliferation of YYT rat cancer cells (6-1.5% ginger extract; 100-4  $\mu$ M 6-gingerol); 2) an indirect effect on MS1 endothelial cell function, either at the level of endothelial cell proliferation or through inhibition of MS1 endothelial cell tube formation (100-0.8  $\mu$ M). The compound 6-gingerol was most effective at lower doses in inhibiting the formation of endothelial cell tubes [18,46]. One of the main uses of ginger is also in the treatment of inflammatory diseases of the urinary tract [19,47]. Ulcerative colitis, Crohn's disease, rheumatoid arthritis, psoriasis and lupus erythematosus are some of the common inflammatory diseases [20,48,54]. These lesions are highly disabling and share common signals such as inflammatory sequences and immune dysregulation [21,49,55]. Consumption of foods with anti-inflammatory properties such as ginger (*Zingiber officinale* Roscoe) may improve the quality of life of these patients [22,50,56]. We know that ginger does not affect the mucosa because ginger has been measured to increase mucosal prostaglandin synthesis after ingestion, as it does not act as a COG-1 inhibitor [23,51,57]. The aim of this work was to review the literature regarding the use of ginger extract and [6]-gingerol against oncogenic and oxidative-inflammatory processes associated with cancer, as well as the main mechanisms of action involved in signaling pathways [24,52,58]. This will shed light on the protective or therapeutic role of ginger derivatives in oxidative and inflammatory regulation in metabolic disorders, as well as on antiproliferative and anticancer properties [25,53].

**Conclusion.** Ginger has been shown to have antioxidant properties that neutralize free radicals; inhibition of lipid peroxidation and that these properties may have contributed to the observed gastroprotective effects. We can conclude that the compounds 6-shoagol, zingerone and 8-shoagol show promising results in human and animal models in reducing some of the main symptoms of some

inflammatory diseases such as arthritis. In lupus, 6-gingerol has shown a protective attenuation of neutrophil extracellular trap release in response to phosphodiesterase inhibition. Ginger reduces NF- $\kappa$ B in psoriasis and its short-term administration may be an alternative concomitant treatment. Ginger may act as a supplement and protect against cancer. In addition, in chemotherapy, ginger may reduce some of the symptoms of treatment (such as nausea).

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